

CLAIMS

1 1. A network device assembly employed in a communication system comprising:
2 a plurality of network devices able to communicate network information
3 through a packet switching to a technical support center operated by technical support
4 staff, each of the plurality of network devices including one or more hardware subsystems
5 and one or more software subsystems and for monitoring the status of the hardware and
6 software subsystems included therein so that when a problem occurs with respect to one
7 or more of the hardware and software subsystems of a particular one of the plurality of the
8 network devices, the particular network device sends a first message to the technical
9 support center notifying the technical support center of the problem.

1 2. A network device assembly as recited in claim 1 wherein the first message is in the
2 form of an email message.

1 3. A network device assembly as recited in claim 1 wherein the first message is in the
2 form of a fax transmission.

1 4. A network device assembly as recited in claim 1 wherein the first message is in the
2 form of a page.

1 5. A network device assembly as recited in claim 1 including a processor for executing
2 embedded software for monitoring the status of the hardware and software subsystems.

1 6. A network device assembly as recited in claim 1 wherein the packet switching
2 network is the Internet.

1 7. A network device assembly as recited in claim 1 including a computer register for
2 indicating the status of the hardware and software subsystems immediately before the
3 problem.

1 8. A network device assembly as recited in claim 7 wherein the computer register
2 includes error messages for identifying a particular hardware or software subsystem failure.

1 9. A network device assembly as recited in claim 1 wherein each of the plurality of
2 network devices includes a remote diagnostic embedded process subsystem, a hardware
3 health status monitor subsystem and a software health status monitor subsystem, the remote
4 diagnostic embedded process subsystem for communicating with the hardware health status
5 monitor subsystem and a software health status monitor subsystem and for collecting status
6 information provided by the software health status monitor subsystem and the hardware
7 health status monitor subsystem and for detecting problems encountered by the hardware and
8 software subsystems.

1 10. A network device assembly as recited in claim 1 wherein the plurality of network
2 devices is responsive to a second message generated by the technical support center for
3 requesting further information regarding the problem.

1 11. A network device assembly as recited in claim 1 wherein at least one of the plurality
2 of network devices is an access server.

1 12. A network device for use in communication with a technical support center operated
2 by a technical support staff, the technical support center being in communication with the
3 network device through a packet switching network, comprising:

4 one or more hardware subsystems;
5 one or more software subsystems; and
6 means for monitoring the status of the hardware and software subsystems so
7 that when a problem occurs with respect to one or more of the hardware and software
8 subsystems of the network device, the network device transmits a first message to the
9 technical support center to notify the technical support center of the problem.

1 13. A network device as recited in claim 12 wherein the technical support staff is able to
2 diagnose the problem without interruption to the operation of the network device.

1 14. A network device as recited in claim 12 wherein the first message is in the form of an
2 email message.

1 15. A network device as recited in claim 12 wherein the first message is in the form of a
2 fax transmission.

1 16. A network device as recited in claim 12 wherein the first message is in the form of a
2 page.

1 17. A network device as recited in claim 12 wherein the packet switching network is the
2 Internet.

1 18. A network device assembly as recited in claim 12 wherein the network device is an
2 access server.

1 19. A network device as recited in claim 12 including a remote diagnostic embedded
2 process subsystem, a hardware health status monitor subsystem and a software health status
3 monitor subsystem, the remote diagnostic embedded process subsystem for communicating
4 with the hardware health status monitor subsystem and a software health status monitor
5 subsystem and for collecting status information provided by the software health status
6 monitor subsystem and the hardware health status monitor subsystem and for detecting
7 problems encountered by the hardware and software subsystems.

1 20. A network device as recited in claim 19 wherein the remote diagnostic embedded
2 process subsystem detects an error message prior to the transmission of the first message.

1 21. A network device as recited in claim 20 wherein the remote diagnostic embedded
2 process subsystem detects certain criteria regarding the status of the network device prior to
3 the transmission of the first message.

1 22. A network device as recited in claim 12 wherein the technical support center generates
2 a second message and sends the same to the network device for requesting further information
3 regarding the problem.

1 23. A network device as recited in claim 12 wherein the network device is in
2 communication with a user and further wherein the technical support center includes an email
3 server coupled to a command-formatter for communicating with a user interface, the email
4 server for collecting the first message, the command-formatter for translating the first
5 message into a format that is understandable to the user and the user interface for displaying
6 information communicated between the network device and the user.

1 24. A method for detecting a problem in a network device comprising:
2 during the operation of the network device, able to communicate network
3 information through a packet switching network to a technical support center being
4 operated by a technical support staff, the network device including one or more hardware
5 subsystems and one or more software subsystems, monitoring the status of the hardware
6 and software subsystems;

7 detecting the occurrence of a problem associated with one or more of the
8 hardware and software subsystems of the network device; and

9 sending a first message to the technical support center for notification of the
10 problem so that the technical support staff is able to diagnose the problem without
11 interruption to the operation of the network device.

1 25. A computer readable medium having stored therein computer readable program code
2 comprising instructions for performing the following steps:

3 during the operation of a network device, able to communicate network
4 information through a packet switching network to a technical support center being
5 operated by a user, the network device including one or more hardware subsystems and
6 one or more software subsystems, monitoring the status of the hardware and software
7 subsystems;

8 detecting the occurrence of a problem associated with one or more of the
9 hardware and software subsystems of the network device; and
10 sending a first message to the technical support center for notification of the
11 problem so that the technical support staff is able to diagnose the problem without
12 interruption to the operation of the network device.

20